DOCUMENT RESUME

ED 296 940 SO 019 264

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TITLE Effects of a Secondary Curriculum for Moral Development and Critical Thinking.
PUB DATE 7 Apr 88
NOTE 20p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 5-9, 1988).
PUB TYPE Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Citizenship Education; Cognitive Processes; *Critical Thinking; Curriculum Development; *Ethical Instruction; *Evaluative Thinking; *Moral Development; *Moral Values; Secondary Education; *Secondary School Curriculum; Social Science Research; Social Studies; Student Attitudes; Student Behavior
IDENTIFIERS Illinois

ABSTRACT

One thread that runs through the definition of what students are to become as a result of their participation in the U.S. school enterprise is the ability to think analytically and behave ethically. This paper describes an effort at curriculum design in which attempts were made to increase critical thinking skills and moral development in secondary students. Tiskilwa High School (Illinois) received funds to establish an experimental program in responsibility education. The curriculum of this experimental program was composed of five separate but integrated parts. Part A was a debate about intellectual issues of both high and low pertinence. Part B concerned practice in critical thinking skills through exercises drawn from a variety of sources. In Part C, students were encouraged to use the critical thinking skill categories to identify instances in which critical thinking skills were absent. Part D contained value issues of both high and low pertinence. The final part of the program, part E, consisted of a student-directed independent learning project. Student volunteers from the upper one-half of their respective classes were selected for the study. A nearby rural high school of similar size and socioeconomic composition was selected as a quasi-control group. Students from the Tiskilwa (Illinois) group made a significant gain in both moral reasoning and critical thinking skills. (SM)

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ED296940

Effects of a Secondary Curriculum for Moral Development and Critical Thinking

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A paper prepared for presentation at the
1988 AERA annual meeting

April 7, 1988

Running head: CRITICAL THINKING AND MORAL DEVELOPMENT

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Effects of a Secondary Curriculum for Moral Development and Critical Thinking

In the continuing effort to define what students are to become as a result of their participation in the American School Enterprise, several formalized attempts at definitions have emerged. Interestingly, one thread that runs through these many efforts focuses on the ability to think analytically and behave ethically. This paper describes an effort at curriculum design in which attempts were made to increase critical thinking skills and moral development in secondary students, and which resulted in a significant change in learner behavior.

The Thinking Skills/Ethics Theme in Educational Goals

In 1893, the National Educational Association formed the Committee of Ten in one of the earlier efforts to formalize statements of the purpose of the American high school. Among others, the following recommendations emerged. ". . . Every subject studied should cultivate the pupils' powers of observation, memory, expression, and reasoning," and ". . . prepare pupils for the duties of life" (U.S. Commissioner of Education, 1892-93, p. 1474-5). Even though the main result of the recommendations of the Committee of Ten was to free the high school from many of the dictates of higher education that were reflected in the high school curriculum, the two quotes above clearly show an interest in reasoning and duty.

By 1913, the Commission on the Reorganization of Secondary Education, appointed by the NEA, recommended what was probably to become the most famous

statement of the purposes of the high school. Their report became known as the "Seven Cardinal Principles." What is striking about this statement is that only one of the seven deals with what most would consider intellectual needs. Not only was the secondary school to specifically develop "ethical character" by providing opportunities to make ethically correct decisions, but it was to concern itself with five other selected values: (1) The importance of good health, (2) worthy home membership, (3) commitment to citizenship, (4) worthy use of leisure time, and (5) an appreciation for all vocations. The one principle that dealt with cognitive activity was the "command of fundamental processes" (U.S. Bureau of Education, 1918).

At the height of the depression, the country shifted toward an emphasis on vocational and civic responsibility. Although the thrust toward moral and intellectual development was not totally neglected, the public clamor to use the schools to assist in lifting the country out of the depression relegated these two principles to a secondary position. The American Youth Commission (Douglas, 1937) and the Educational Policies Commission, with their emphasis on vocational and civic responsibility, are examples of that shift (Educational Policies Commission, 1938).

By the end of World War II, the National Association of Secondary School Principals had noted the massive scientific breakthroughs created because of war needs, and began to think of science as an area deserving more emphasis. Once again, the word "rationality" began to appear (National Association of Secondary School Principals [NASSP], 1947), and in 1961 the idea that the primary objective of education should be to improve the rational powers of students was articulated by the Educational Policies Commission. Many of the previously-

stated goals for the high school were reorganized toward creating the rational person (National Education Association [NEA], 1961).

More recently, a most influential document affecting schools is A Nation At Risk. On August 26, 1981, Secretary of Education T. H. Bell created the National Commission on Excellence which attempted to assess the quality of teaching and learning in our nation's schools. Among the Commission's findings was that "Many 17-year-olds do not possess the 'higher-order' intellectual skills we should expect of them." And under the Report's first recommendations is the appeal, ". . . finally, help your children understand that excellence in education cannot be achieved without intellectual and moral integrity, coupled with hard work and commitment" (National Commission of Excellence in Education, 1983, pp. 9, 35). The total tone of A Nation At Risk is to upgrade education in any and all conceivable ways. The underlying thrust is for improved intellectual growth, and a renewed moral commitment.

Although various goal-writing groups have used a variety of terms for the development of thinking ability (i.e., intellectual growth, increased cognition, improved higher-order skills, greater rationality) and the improvement of morality (i.e., commitment to duty, improved ethics, increased integrity), it is highly unusual to find secondary curricula directly addressing either of these two goals. That is, schools foster improved thinking and morality in their students only incidentally, within the content-oriented courses.

The Definition and Measurement of Critical Thinking and Moral Development

The ability to reasonably assess critical thinking has not been an easy task. The roots of present-day critical thinking measures are easily traced to early tests of human intelligence. These efforts reflect the initial work of

Binet (1916) and Spearman (1904) and the multiple abilities research of others such as Thurstone (1936) and Guilford (1959). While this latter line of reasoning and research focused largely on the measurement of human abilities, present work continues into the nature of the cognitive processes. One such process, of major concern in this study, is critical thinking.

Dressel and Mayhow (1954) defined critical thinking as a composite of many abilities, and when the Watson-Glaser Critical Thinking Appraisal (CTA) was developed, it focused on five different abilities (Burros Mental Measurement Yearbook, 5th ed.). The CTA reflects a wealth of previous research and was selected for this study because it has been well-validated in those efforts. It generally appears to reflect the inference, problem identification, deduction and evaluation processes associated with critical thinking.

In like fashion, assessment of moral development has not been a simple task. Building on the methodology of Piaget (1948), and going beyond values clarification (Raths, Harmin, & Simon, 1966), Kohlberg (1975) developed and validated a six-stage model for classifying moral development. The concept of stages (as used by Piaget and Kohlberg) implies the following characteristics:

1. Stages are "structured wholes," or organized systems of thought. Individuals are consistent in level of moral judgment.
2. Stages form an invariant sequence. Under all conditions except extreme trauma, movement is always to the next higher stage.
3. Stages are "hierarchical integrations." Thinking at a higher stage incorporates lower-stage thinking. There is a tendency to function at or

prefer the highest stage available. (Kohlberg, June 1975, p. 672)

Through the use of an individualized scoring system Kohlberg is able to classify the moral development of individuals through their verbal responses to a set of moral dilemmas.

It would appear, then, that Kohlberg's work could be used to measure the moral development of students for purposes of empirical research, and it has been so used. However, procedures for classifying are time-consuming, the scoring systems elaborate, and special training required. Fortunately, James Rest, at the University of Minnesota and Head of the Minnesota Moral Research Project, colleague and co-author of articles with Kohlberg, has developed an objective test of moral judgment development (the Defining Issues Test--DIT) based on Kohlberg's work. Obviously, an objective test indicating a moral development level is more easily administered and scored.

Although for heterogeneous groups correlations between Kohlbergian stages and the DIT are up to the .70s, Rest cautions, ". . . it is inappropriate to use the DIT to predict scores on Kohlberg's test" (Rest, 1979, p. 5.2). This is because "Kohlberg's assessment locates a subject in a developmental sequence by stage-typing (i.e., providing decision rules for saying a subject is in one or another stages), whereas the DIT's P or D index locates a subject in terms of a continuous number representing the development continuum" (Rest, 1979, p. 5.1). This, however, does not preclude one from using the Rest Test to assess moral development growth as a construct.

The reliability and validity of the DIT has been verified through its use in

hundreds of studies and is documented in the book, Development in Judging Moral Issues (Minneapolis: University of Minnesota Press, 1979). Its use as a measure to assess growth in moral development appears justifiable.

What are the implications of these two constructs for curricula? The CTA contains five subtests: (1) inference, which is a conclusion a person can draw from certain observed or supported facts; (2) recognition of assumptions, which is the recognition of something presupposed or taken for granted; (3) deduction, which is the ability to determine if suggested conclusions follow beyond a reasonable doubt from given statements assumed to be true; (4) interpretation, which is to judge whether proposed conclusions logically follow from given information; and (5) evaluation of arguments, which is the ability to distinguish between arguments that are strong and those that are weak.

The DIT, on the other hand, sets up moral dilemmas or value conflicts, asks the student to take a stand, and then classify considerations to the degree of importance to their position. They then rank their top four considerations hierarchically. The choices are classifed according to a scale based on Kohlberg's work to generate a score reflecting a degree of moral development.

Kohlberg states that in order to grow in moral development the important conditions appear to be:

1. Exposure to the next higher stage of reasoning.
2. Exposure to situations posing problems and contradictions for the child's current moral structure, leading to dissatisfaction with his or her current level.
3. An atmosphere of interchange and dialogues combining the first two conditions, in which conflicting moral views are compared in an open manner. (Kohlberg, 1975).

It can be concluded from these elements that a curriculum model that would maximize the potential for critical thinking and moral development would include: (1) an issues orientation, (2) some issues focusing on intellectual conflicts, (3) some issues focusing on value conflicts, (4) issues described in group situations and one-on-one situations, and (5) the development of skills in identifying flaws in the defense of positions taken on issues.

Finally, it behooves researchers examining constructs such as moral development and critical thinking through curricular manipulations to evaluate attitudinal shifts in students experiencing such programs. In this regard a semantic differential was designed to assess attitudes toward the concepts: 1) myself, 2) my responsibility, 3) my school, and 4) my community. A dozen pairs of appropriate bipolar adjectives from Osgood, et al. was constructed, with each pair arrayed on a five-point scale.

Method

Treatment. Under a grant from the State of Illinois, Tiskilwa High School in Tiskilwa, Illinois received funds to establish an experimental program in responsibility education. The curriculum of this experimental program was composed of five separate but integrated parts. Part A was made up of discussions, debate over intellectual issues with both higher pertinence (i.e., class management processes) and low pertinence (i.e., which of the three possible criteria should be used by a hypothetical family for the purchase of a car). Part B was practice in critical thinking skills through exercises drawn from a variety of sources. In Part C students were encouraged to use these categories during discussion-debate to identify instances in which critical thinking skills were

apparently absent from suggested rationales for positions taken, statements made for or against solutions and comments ventured. Students were encouraged to separate personality from issue so that concepts and ideas became the focus of attention. Part D was made up of value issues with both high pertinence (i.e., should cheerleaders caught drinking on a school bus be dismissed from the cheerleading squad?) and low pertinence (i.e., should the U.S. have dropped the Abomb on Hiroshima and Nagasaki?). When an incidence of high pertinence involving value conflicts was discussed, school staff members not directly involved in the class were often used as resource people. For instance, in the high pertinence dilemma described above, the school disciplinarian was involved in a highly organized way. First the students discussed the problem, drew conclusions, and identified questions to be asked of the disciplinarian. When the disciplinarian visited the class at a scheduled time, facts were verified, justifications for actions were shared, questions devised by the students were addressed, and further dialogue was encouraged. In the follow-up process students not only shared views, but also entered reactions in an on-going journal. The teacher, who had attended in-service sessions on Kohlbergian theory, organized sessions so that students' justifications for value positions taken were reflective of all levels of moral development and thus available to all students.

The final part of the program, Part E, consisted of a student-directed independent learning project. At the heart of this effort was the assignment of a mentor for each student. In in-service workshops, teachers were given instruction in Kohlbergian Theory, critical thinking skills, the independent study process and anticipated hurdles. As students encountered problems and dilemmas in the process of completing their projects, the teachers, as mentors,

were able to engage in a series of one-on-one interchanges in efforts to assist the students in organizational strategies, task analysis and reflective thought.

Each student received a five-step learning packet used throughout the project. In step one, a series of introspective surveys were used to identify areas of sincere interest. In step two, each student narrowed his or her broad interest area to a specific project. At the culmination of step two, students and mentors signed a "Project Agreement" outlining preliminary ideas including such things as community resource people to be used, rationales for the project, mentor comments and projected completion dates. At steps three and four, students outlined their entire work plans, specifying subtasks and check-out dates. At step five, students responded to an on-going evaluation of the success of each task, including their perceptions of how the completion of the tasks met their expectations, and were given an opportunity to modify their planned activities in light of their current status. Projects were then completed over the course of the year while students kept a "log" of the experience. The students' projects culminated in a PTA Parents' Night during which students displayed projects and entered into dialogue with interested adults on what they had accomplished.

Subjects. Volunteer students from the upper halves of their respective classes were selected for study. A nearby rural high school of similar size and socioeconomic make-up was selected as a quasi-control, and volunteer subjects from that school were matched to treatment subjects on IQ, mathematics abilities, reading achievement and grade point average. After matching, the mean IQ scores for treatment and control groups were 113 and 115, respectively. In the second project year, the same groups were used except for replacement of

subjects lost through natural attrition. When subjects were replaced, selection procedures followed first-year criteria. When a treatment subject was unavailable for testing, the data for the corresponding control subject were not used in the data analysis.

Results

Moral Reasoning. Data from the DIT were evaluated using a pretest-posttest analysis of covariance on the treatment and control groups. The covariance analysis was used to adjust for treatment control differences remaining after matching of the groups. The covariate was the pretest score, the dependent variable was the posttest score. Table 1 presents the mean pretest, posttest, and adjusted posttest P-Scores of the DIT for both Treatment and Control groups. The manual of the DIT describes the procedure for obtaining the P-scores.

Table 1

Means for DIT

	Pretest	Posttest	Adj. Posttest
Treatment	16.14	18.29	18.09
Control	14.85	14.75	14.98

The difference between the adjusted posttest means was significant ($F_{666} = 4.58$, $p < .05$).

Critical Thinking. Data from the five Watson-Glaser critical thinking subtests were analyzed using the same design as that used with the DIT, except that data for a second project year were also available. Table 2 presents the mean pretest, posttest, and adjusted posttest scores for both treatment and control groups, but for two years.

Table 2

Means for the Critical Thinking Subtests

		Treatment		Control	
		First Year N = 36	Second Year	First Year N = 42	Second Year
Inference	Pretest	7.75	8.15	6.79	6.89
	Posttest	8.92	8.65	7.33	6.24
	Adj. Post	8.70	8.17*	7.52	6.71
Assumptions	Pretest	10.97	9.56	10.37	11.41
	Posttest	10.33	11.12	10.83	11.35
	Adj. Post	10.20	11.57	11.08	11.90
Deductions	Pretest	10.31	9.91	9.31	9.50
	Posttest	10.78	10.76	9.29	9.40
	Adj. Post	10.50	10.67*	9.50	9.50
Interpretation	Pretest	11.58	11.56	10.90	10.56
	Posttest	12.03	12.47	10.38	9.06
	Adj. Post	11.80*	12.21*	10.40	9.31
Arguments	Pretest	10.19	10.71	10.17	10.06
	Posttest	11.19	11.68	9.33	8.15
	Adj. Post	11.20*	11.52*	9.30	8.31

Inference F-Value: First Year, N.S.; Second Year, $F_{1,65} = 6.03$, $p < .05$

Assumptions F-Value: First Year, N.S.; Second Year, N.S.

Deductions F-Value: First Year, N.S.; Second Year, $F_{1,65} = 5.38$, $p < .05$

Interpretations F-Value: First Year $_{1,75} = 7.93$, $p < .05$;

Second Year, $F_{1,65} = 23.65$, $p < .05$

Arguments F-Value: First Year, $F_{1,75} = 11.97$, $p < .05$;

Second Year, $F_{1,65} = 35.12$, $p < .01$

Attitudes. Data from the semantic differential were organized so as to assess attitudes toward the concepts: 1) myself, 2) my responsibility, 3) my school, and 4) my community were correlated to confirm the "inner" and "external" nature of the concepts. Table 3 (reflected also in Figure 1) presents the correlations from the second-year data.

Table 3

CORRELATIONS BETWEEN SEMANTIC DIFFERENTIAL SCALES FOR SECOND-YEAR DATA

	Myself	My Responsiblity	My School	My Community
Myself	.58	.72	.37	.30
My Responsibility		.49	.35	.26
My School			.42	.69
My Community				.69

The pattern of high and low intercorrelations clearly supports a "grouping" of the concepts Myself and My Responsibility, and My School and My Community as internal and external, respectively. The diagonal elements of the matrix present the stability reliability coefficients over the eight months between test and retest.

Table 4 presents the means for two years for the internal and external concepts, with low scores indicating positive attitudes.

Table 4

MEANS FOR THE SEMANTIC DIFFERENTIAL

	Internal Concepts		External Concepts	
	Myself	My Responsibility	My School	My Community
Treatment				
First Year (N = 36)	58.1*	66.6*	62.2*	61.1*
Second Year (N = 33)	53.8*	59.7	58.2*	55.4
Control				
First Year (N = 36)	49.9	57.4	72.3	70.9
Second Year (N = 33)	46.8	55.7	66.6	62.0

Myself: First Year $F_{1,70} = 6.79$, $p < .05$; Second Year, $F_{1,64} = 4.04$, $p < .05$

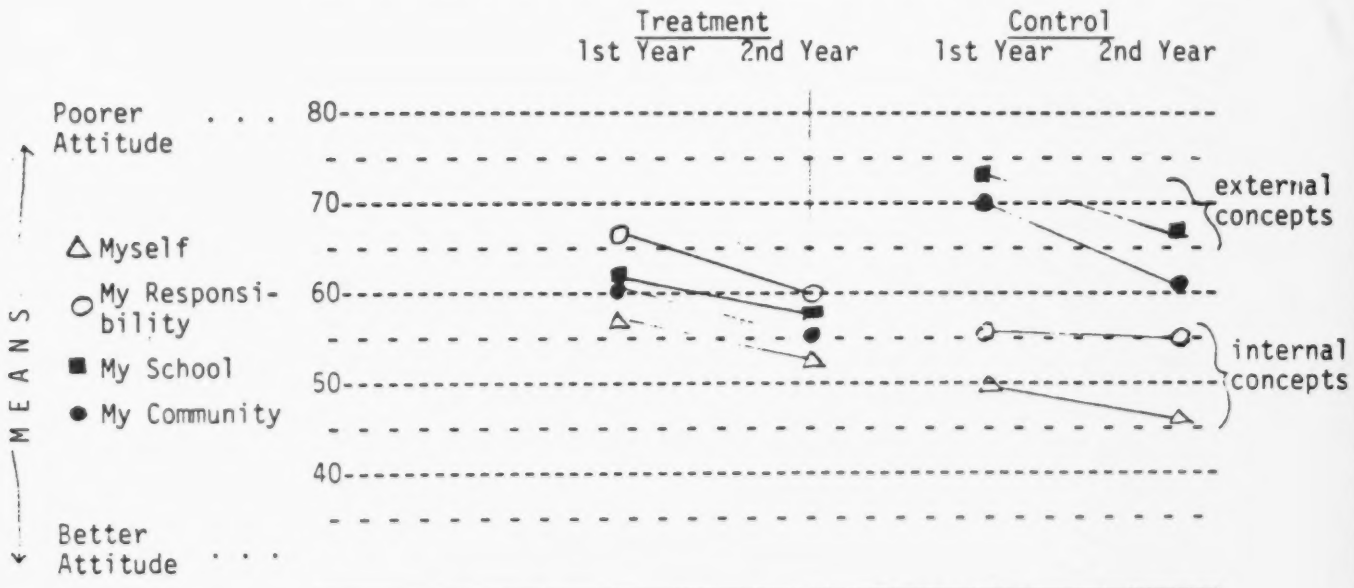
My Responsibility: First Year, $F_{1,70} = 11.07$, $p < .05$; Second Year, N.S.

My School: First Year, $F_{1,70} = 7.37$, $p < .05$; Second Year $F_{1,64} = 5.32$, $p < .05$

My Community: First Year, $F_{1,70} = 4.72$, $p < .05$; Second Year, N.S.

Figure 1

PLOT OF SEMANTIC DIFFERENTIAL MEANS BY YEAR



Discussion.

This discussion will focus on three major areas. First, what variables other than the treatment could account for the significant difference between the treatment and control groups' posttest scores on the Moral Development and Critical Thinking measures? Second, what is implied in the attitude measure analysis? Third, what educational significance can be discerned in the results of the study?

It is possible that there were pretest-treatment interactions among the experimental group. That is, the act of taking the Defining Issues Test and the Watson Glaser Test of Critical Thinking Skills empowered the treatment subjects with a predisposition toward their treatment which enabled them to score better on the posttest than if they had not taken the pretest. Thus, if the treatment were repeated without the pretest, the same results would not be attained. Each of these tests takes about 45 minutes to administer. The treatment that directly addressed the skills tested was experienced an hour each day over the school year. It seems unlikely that with such a treatment/pretest time ratio (approximately 200:1) that the pretest influence would have had any measurable effect.

A second variable that might cause the significant difference between post-test scores instead of the curricular treatment is the Hawthorne effect. Although students did not view themselves as being in an experiment, they were in a class that was not part of a regular high school curriculum. In this regard it is possible that being part of this class made the students feel special, and therefore motivated them to try harder on the posttest than the control group. This suggestion would seem to make more sense for an outcome

such as production quantity (as in the Hawthorne experiments) than an intellectual construct such as moral development and critical thinking.

Similarly, even though both the experimental and control groups were made up of volunteers, they were volunteering for different things. It is feasible that the volunteers for the pretest/posttest among the controls were not motivated by the same predispositions as the volunteers for the pretest/class/posttest. The fact remains, however, that the controls were matched on several pertinent variables.

It is the opinion of the authors, after examining the curriculum, environment and design, that the most likely explanation for the significant gains by the treatment group is that group's curriculum activities.

In regard to the analysis of the attitude measure, the reader is asked to note in Figure 1 the systematic pattern of declining slopes, indicating improved attitudes among treatment subjects. Second, note the elevation patterns among treatment and control subjects, and the moderated attitude of treatment subjects on all concepts. The figure seems to indicate that, as a result of the program, treatment students feel better about their school and community (external concepts), and appear to better realize human limitations in resolving some of the dilemma issues which they and community leaders must eventually face. Our inference thus would be that the interaction with school and community leaders over numerous real moral dilemmas brought about this change.

If these conclusions about the data are correct, what can be said of the results? First, it is obvious that a powerful influence in this study was the teacher effect. If school districts are inclined to attempt to improve critical

thinking and moral development, it is obvious that teachers involved will need special training. A question that remains is whether significant results may be attained without special classes. That is, would it be possible to induce such gains in regular content areas (English, history, mathematics, etc.) relying merely upon internal curricular adjustments?

Second, this school setting has a relatively small student population and is located in a rural area. It is possible that in an urban setting, with a large school population, extraneous influences could overshadow these gains. Further studies are needed to determine if generalizability is appropriate. Finally,

the treatment was multifaceted. No attempt was made to determine if one element of the curriculum produced the major effect or if the effect resulted from treatment interactions. For instance, just conducting discussions about value conflicts or just mentoring with individual projects might fail to produce significant results.

In spite of these apparent limitations, it is important to show that curriculum adjustments can be made for high school students that will significantly improve their scores in critical thinking and moral development measures. Further, it may well be that working in both critical thinking and moral development simultaneously can have a mutually positive effect. Certainly, the future will again document societal "adjustments" in the American School Enterprise. Our prediction is that as such phenomena evolve, critical thinking and moral reasoning will ultimately emerge to share the limelight with science and technology. Further, as the beleaguered American family confronts the pressures of the future, the schools will continue to be hero or scapegoat in the public's assessment of citizens' critical thinking and moral development skills.

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